

CLAIMS:

1. A nucleic acid isolate comprising a sequence of nucleotides which encodes or is complementary to a sequence which encodes a type II serine proteinase inhibitor (PI) precursor from a plant wherein said precursor comprises at least three PI monomers and wherein at least one of said monomers has a chymotrypsin specific site and at least one other of said monomers has a trypsin specific site.
2. A nucleic acid isolate according to claim 1 wherein said PI precursor comprises at least four monomers.
3. A nucleic acid isolate according to claim 1 wherein the PI precursor comprises at least five monomers.
4. A nucleic acid isolate according to claim 1 wherein the PI precursor comprises at least six monomers.
5. A nucleic acid isolate according to claim 1 wherein said isolate comprises a sequence of nucleotides as set forth in SEQ ID NO. 1 or having at least 55% nucleotide similarity to all or part thereof.
6. A nucleic acid isolate according to claim 1 or 5 wherein said nucleic acid isolate is capable of hybridising under low stringency conditions to a complementary sequence to SEQ ID NO. 1.
7. A nucleic acid isolate comprising a sequence of nucleotides which encodes or is complementary to a sequence which encodes a single type II serine PI having either a chymotrypsin specific site or a trypsin specific site and wherein said PI is a monomer of a precursor PI having at least three monomers of which at least one of said monomers has a chymotrypsin site and the other of said monomers has a trypsin site.

8. A nucleic acid isolate according to claim 7 comprising a sequence of nucleotides which is at least 55% similar to all or part of SEQ ID NO. 1.
9. A nucleic acid isolate according to claim 7 which is capable of hybridising under low stringency conditions to a complementary nucleotide sequence to SEQ ID No. 1.
10. A nucleic acid isolate according to claim 7 or 8 or 9 comprising a nucleotide sequence which encodes a peptide selected from (SEQ ID NO. 5); (SEQ ID NO. 6); (SEQ ID NO. 7); (SEQ ID NO. 8); (SEQ ID NO. 9); (SEQ ID NO. 10).
11. A nucleic acid isolate according to claim 7 or 8 or 9 comprising a nucleotide sequence which encodes a peptide defined by SEQ ID NO. 4.
12. A recombinant type II serine PI precursor from a plant wherein said precursor comprises at least three PI monomers and wherein at least one of said monomers has a chymotrypsin site and at least one other of said monomers has a trypsin specific site.
13. A recombinant PI precursor according to claim 12 wherein said PI precursor comprises at least four monomers.
14. A recombinant PI precursor according to claim 12 wherein said PI precursor comprises at least five monomers.
15. A recombinant PI precursor according to claim 12 wherein said PI precursor comprises at least six monomers.
16. A recombinant PI precursor according to claim 12 wherein said PI precursor comprises a sequence of amino acids as set forth in SEQ ID NO. 3 or having at least 55% similarity to all or part thereof.

17. A monomer of the recombinant PI according to claim 12.
18. A monomer according to claim 17 selected from the list consisting of amino acid residues 25-82 (SEQ ID NO. 5); amino acid residues 83-140 (SEQ ID NO. 6); amino acid residues 141-198 (SEQ ID NO. 7); amino acid residues 199-256 (SEQ ID NO. 8); amino acid residues 257-314 (SEQ ID NO. 9); and amino acid residues 315-368 (SEQ ID NO. 10); of the amino acid sequence set forth in Figure 1 (SEQ ID NO. 3).
19. A monomer according to claim 17 defined by the amino acid residues 1 to 24 (SEQ ID NO. 4) of the amino acid sequence set forth in Figure 1 (SEQ ID NO. 3).
20. A protease sensitive peptide comprising the amino acid sequence:

$$R_1-X_1-X_2-Asn-Asp-R_2$$

wherein X_1 and X_2 are preferably the same and are preferably both Lys residues and wherein R_1 and R_2 may be the same or different and each is a D or L amino acid, a peptide, a polypeptide, a protein, or an alkyl, substituted alkyl, alkenyl, substituted alkenyl, acyl, dienyl, arylalkyl, arylalkenyl, aryl, substituted aryl, heterocyclic, substituted heterocyclic, cycloalkyl, substituted cycloalkyl, halo, haloalkyl, nitro, hydroxy, thiol, sulfonyl, carboxy, alkoxy, aryloxy and alkylaryloxy group and the like.
21. A protease sensitive peptide according to claim 20 wherein R_1 and R_2 may be the same or different and each is a peptide or polypeptide and X_1 and X_2 are each Lys.
22. A protease sensitive peptide according to claim 20 or 21 in recombinant or synthetic form.

23. A nucleic acid molecule encoding the protease sensitive peptide according to claim 22.

24. A genetic construct comprising a nucleic acid molecule comprising a sequence of nucleotides which encodes or is complementary to a sequence which encodes a type II serine PI precursor or monomer thereof from a plant wherein said precursor comprises at least three PI monomers and wherein at least one of said monomers has a chymotrypsin specific site and at least one of said other monomers has a trypsin specific site and wherein said genetic sequence further comprises expression means to permit expression of said nucleic acid molecule, replication means to permit replication in a plant cell or, alternatively, integration means, to permit stable integration of said nucleic acid molecule into a plant cell genome.

25. A transgenic plant carrying a genetic construct, said genetic construct comprising a deoxyribonucleic acid molecule which encodes a type II serine PI or monomer thereof, wherein said precursor comprises a sequence of nucleotides which encodes or is complementary to a sequence which encodes a type II serine proteinase inhibitor (PI) precursor from a plant wherein said precursor comprises at least three PI monomers and wherein at least one of said monomers has a chymotrypsin specific site and at least one other of said monomers has a trypsin specific site.

26. A transgenic plant according to claim 25 which produces one or more PI monomers selected from the listing consisting of amino acid residues 25-82 (SEQ ID NO. 5); amino acid residues 83-140 (SEQ ID NO. 6); amino acid residues 141-198 (SEQ ID NO. 7); amino acid residues 199-256 (SEQ ID NO. 8); amino acid residues 257-314 (SEQ ID NO. 9); and amino acid residues 315-368 (SEQ ID NO. 10) of the amino acid sequence set forth in Figure 1 (SEQ ID NO. 3).

27. A transgenic plant according to claim 25 which produces a PI monomer consisting of amino acid residues 1-24 (SEQ ID NO. 4) of the amino acid sequence set forth in SEQ ID NO. 3.

28. A method of increasing, enhancing or otherwise facilitating resistance of a plant to insect or other pathogen infestation, said method comprising introducing a nucleic acid molecule as defined in claim 1 or 7 or 10 or 11 into a cell or group of cells of said plant, regenerating a plant therefrom and growing said plant for a time and under conditions sufficient to permit expression of said nucleic acid molecule into a PI or precursor thereof capable of inhibiting growth and/or infestation by said pathogen.